

HAZARDS OF HOSPITALIZATION IN THE ELDERLY: CHALLENGES AND OPPORTUNITIES

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DISCLOSURES

I have no financial disclosures

OBJECTIVES;

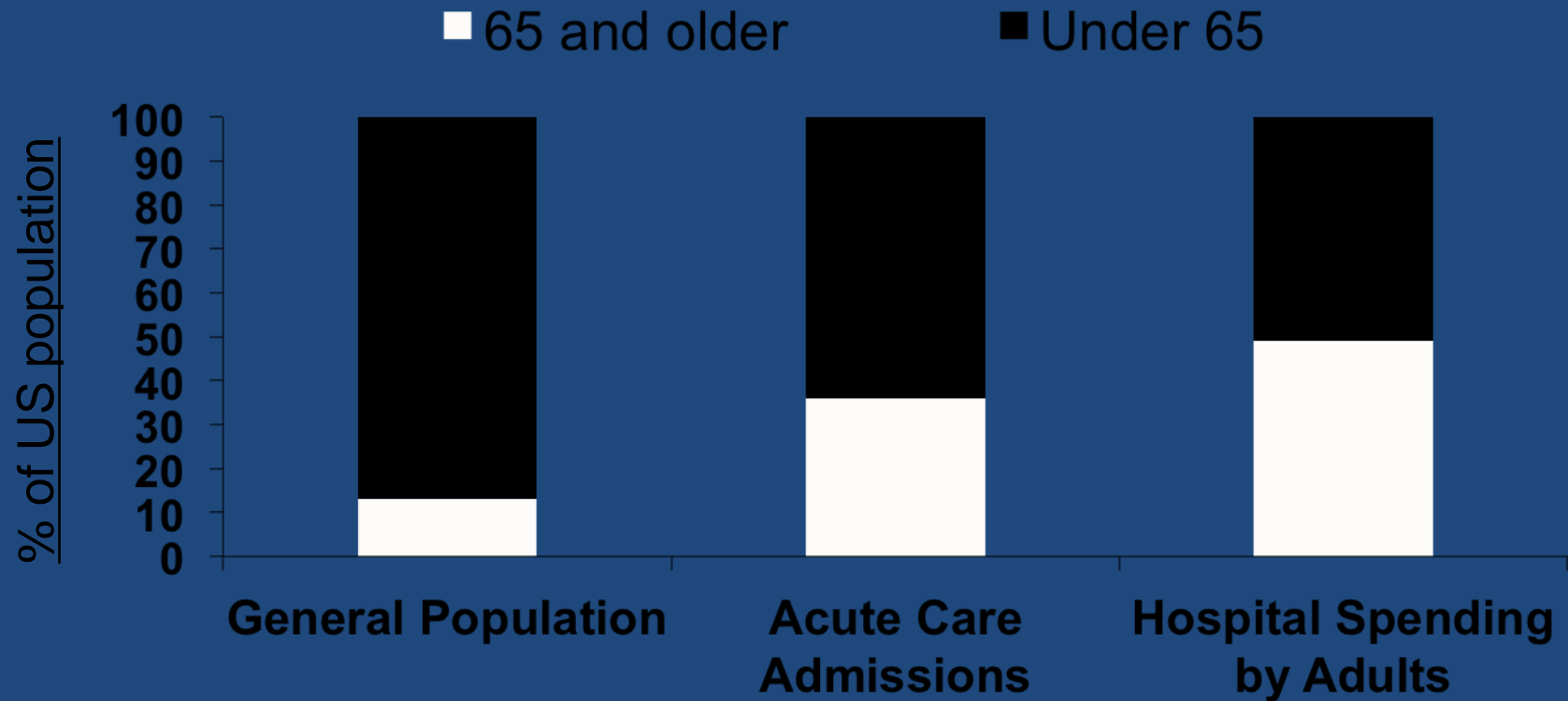
By the end of the presentation, participants will be able to

- Assess and manage problems in hospitalized older patients
- Recognize opportunities for management of common geriatric problems during a hospital stay
- Become familiar with new systems of care for hospitalized older patients that can improve outcomes

Hospitalization can be the beginning of a downward trajectory for many elders with decline in function and quality of life, nursing home placement and death.



DISPROPORTIONATE NEED FOR HOSPITAL CARE OF OLDER ADULTS



MOST COMMON PRINCIPAL DIAGNOSES IN HOSPITALIZED OLDER ADULTS

- Congestive heart failure
- Pneumonia
- Cardiac dysrhythmia
- Acute coronary syndromes

HAZARDS OF HOSPITALIZATION IN THE ELDERLY

- Functional decline
- Iatrogenic illness
- Immobility and falls
- Delirium
- Pressure sores
- Nosocomial infections
- Depression
- Undernutrition
- Polypharmacy
- VTE
- Hypovolemia
- Fecal impaction
- Diagnostic procedures

2010 National Patient Safety Goals (NPSGs)

- Improve the accuracy of patient identification
- Improve the effectiveness of communication among caregivers
- Improve the safety of using medications
- Reduce the likelihood of patient harm associated with the use of anticoagulant therapy
- Reduce the risk of health care–associated infections
- Accurately and completely reconcile medications across the continuum of care
- Reduce the risk of patient harm resulting from falls
- Prevent health care–associated pressure ulcers (decubitus ulcers)

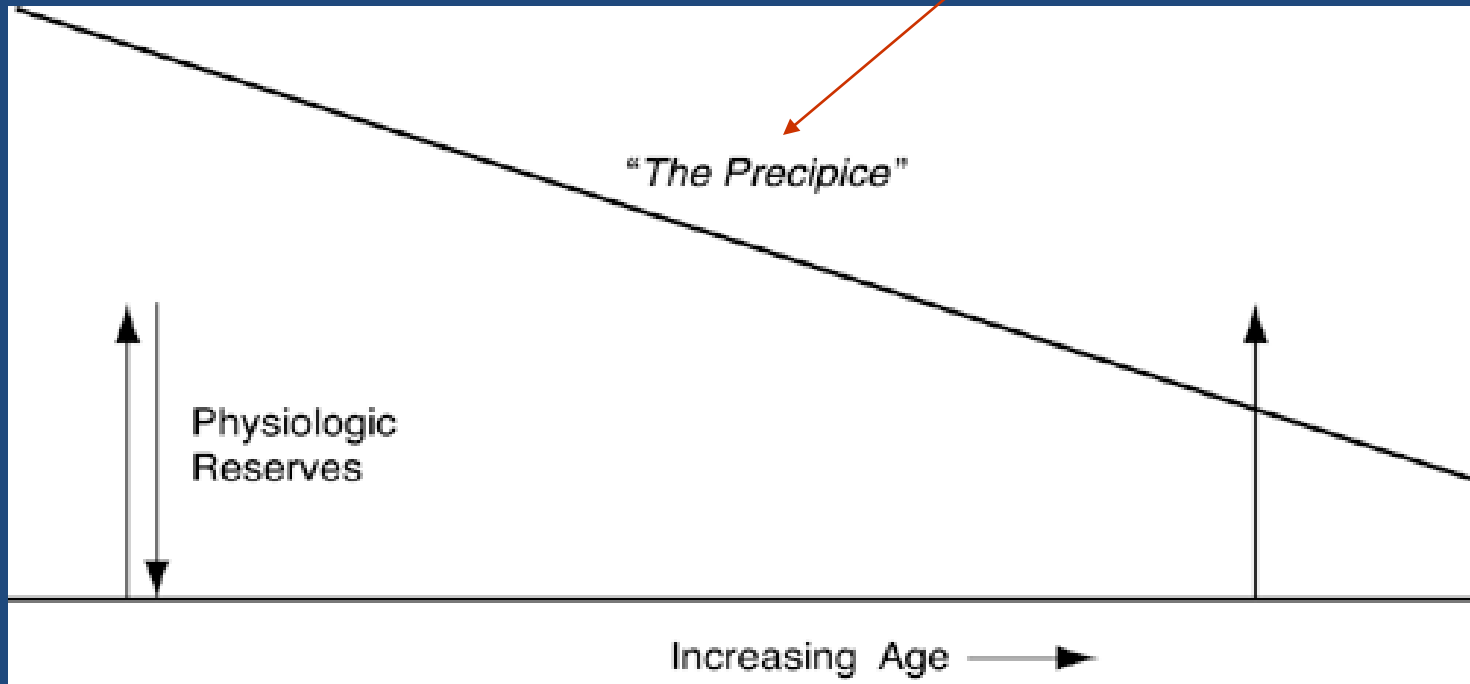
DISPARITIES IN HOSPITAL CARE

- Minority patients are less likely than whites to be treated at high-volume hospitals for services for which volume matters
- Disparity is largest for cancer surgeries and CV procedures

HOSPITALIZED OLDER PATIENTS RECEIVE LESS COSTLY TREATMENT

- Compared with younger adults, seriously ill patients ≥ 80 years receive:
 - Fewer invasive procedures
 - Less costly, less resource-intensive hospital care
- Those differences do not reflect differences in patients' severity of illness or preferences for life-extending care
- Irrespective of the patient's age, the best guides to assessment and management are the clinical circumstances and the patient's preferences

e.g. death, confusion, heart failure,
Weakness, weight loss

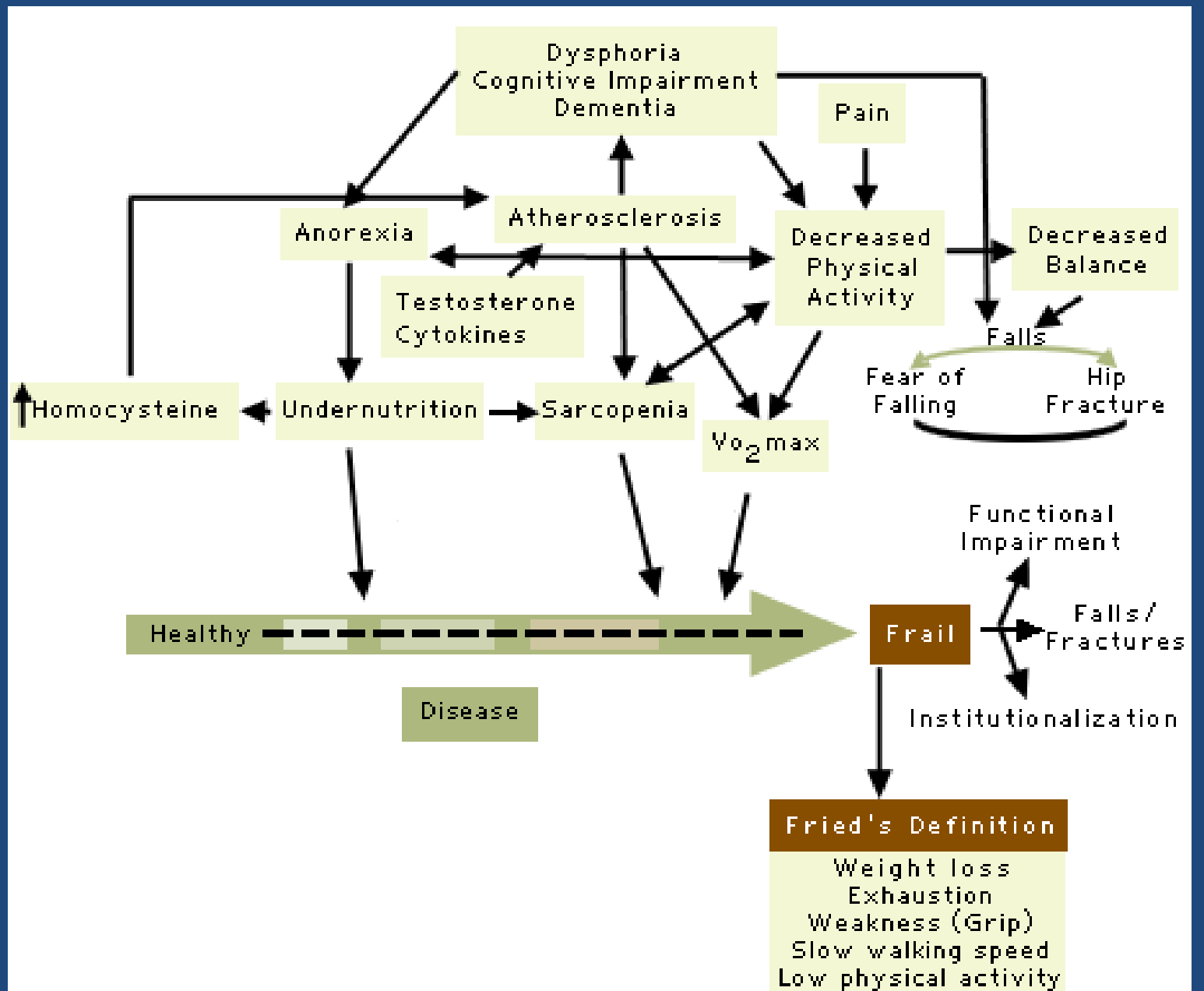


As the individual ages, there is no change in homeostasis, but the amount of physiologic reserves available to counter any challenge to homeostasis decreases with aging.

The elderly
Have
reduced
reserve

Causes of Frailty

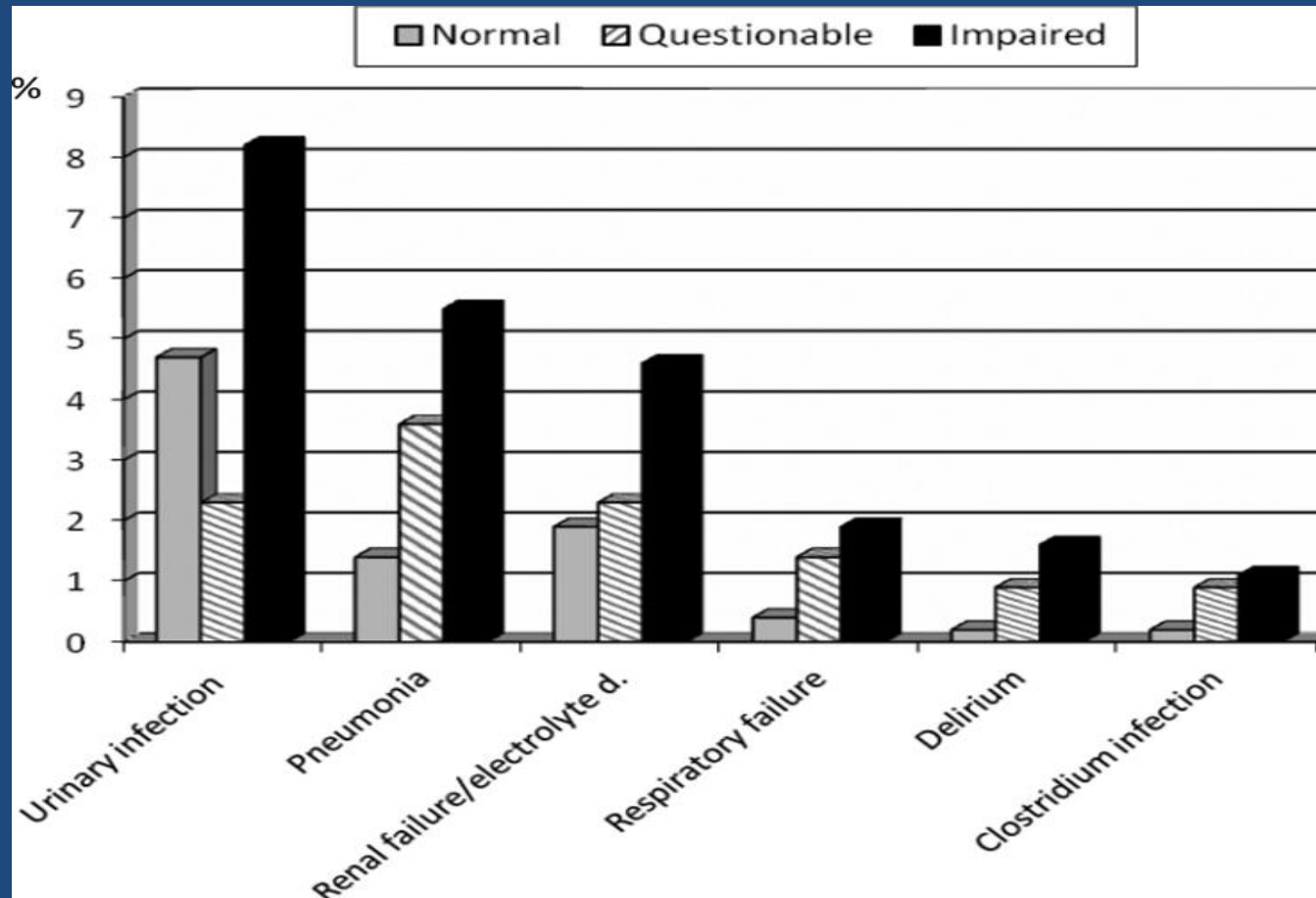
Morley, Fried



Mortality Risk and Cognitive Status in Hospital

Italian study of 1390 pts followed for 3 mth

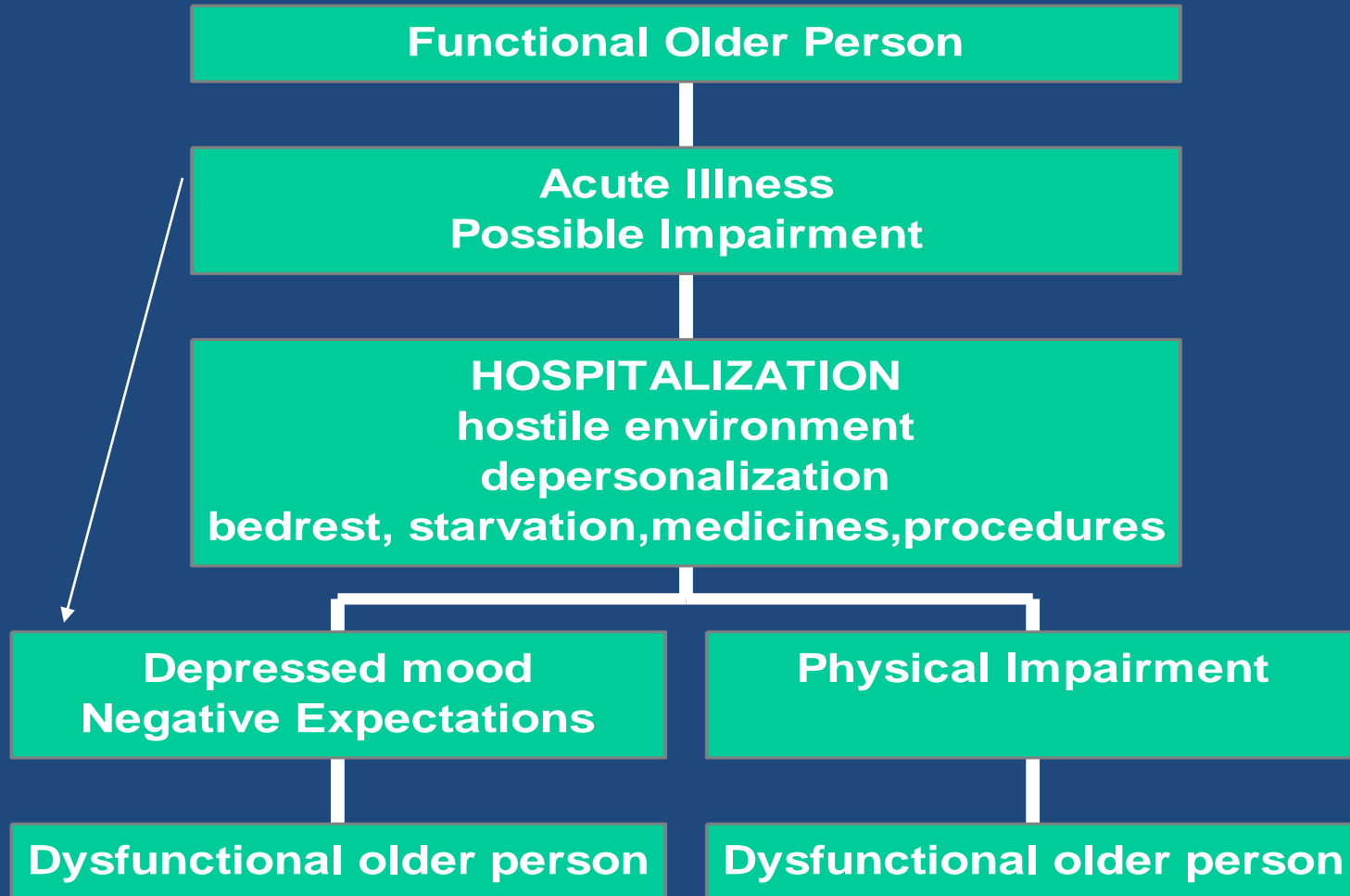
- **Elderly** patients with cognitive impairment are more likely to die during **hospitalization** with a severity-dependent association
- 67.3% versus 32.7% ($p < .001$) of patients who died during **hospitalization** and 54.3% versus 45.7% ($p < .001$) during follow-up had at least one adverse event



Adverse Clinical Events and Mortality During AdHospitalization and 3 Months After Discharge in Cognitively Impaired Elderly Patients.

Marengoni et al. J of Gerontol April 2013 68(4)

Conceptual model of the dysfunctional syndrome



SYSTEMATIC APPROACH TO ASSESSMENT

- Reduces the risk, and consequences, of common hazards of hospitalization, such as deteriorating functional status and adverse drug reactions
- Should include evaluation of function at the level of the organ system, the whole person, and the person's environment
- Can identify need for targeted interventions

OPPORTUNITIES FOR INTERVENTION DURING HOSPITAL STAY (1 of 4)

- It can be tempting to:
 - Devote full attention to the acute medical problems that lead to an older patient's hospital admission
 - Focus entirely on technological tests and treatments
- But optimal care of geriatric inpatients requires systematically looking for and managing the problems listed on the next two slides

OPPORTUNITIES FOR INTERVENTION DURING HOSPITAL STAY (2 of 4)

Problem	Possible interventions
Functional impairments	Assess ADLs on admission; PT, OT; engage social resources
Immobility and falls	Avoid restraints and sedating meds; remove in-dwelling bladder catheters; encourage ambulation, PT
Sensory impairment	Eyeglasses; hearing aids, treat cerumen impaction
Depression	Pharmacotherapy, cognitive therapy, or both

OPPORTUNITIES FOR INTERVENTION DURING HOSPITAL STAY (3 of 4)

Problem	Possible interventions
Delirium or cognitive impairment	Evaluate for delirium or dementia; assess social environment; reorientation; manage delirium nonpharmacologically whenever possible
VTE prevention	Prophylactic anticoagulation for patients with ≥ 1 VTE risk factor; mechanical thromboprophylaxis for high bleeding risk; encourage ambulation
Suboptimal pharmacotherapy	Review all meds at admission and d/c; modify prescriptions; involve pharmacists; consider using explicit appropriateness criteria
Atrial fibrillation	Rate control plus anticoagulation or conversion, or maintain sinus rhythm plus anticoagulation, or both

OPPORTUNITIES FOR INTERVENTION DURING HOSPITAL STAY (4 of 4)

Problem	Possible interventions
Poor nutrition	Supplement water, calories, protein; assess social environment and medical factors that contribute to poor intake
Pressure ulcer prevention	Reposition frequently; use specialized support surfaces; manage moisture and incontinence; encourage ambulation
Sleep disturbance	Address intrinsic and extrinsic causes; use nonpharmacologic protocols
Vaccinations not up to date	Vaccination against influenza, pneumococcus, tetanus

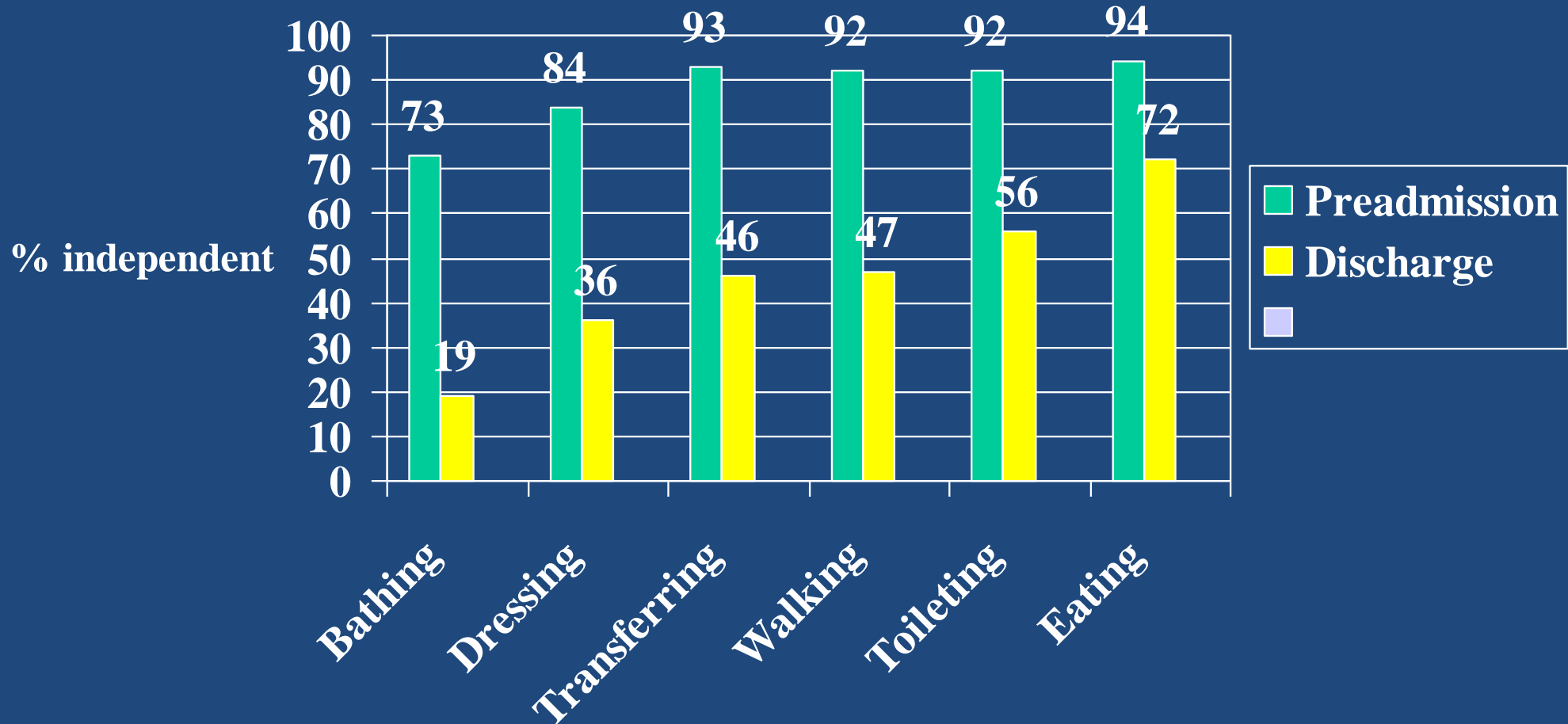
SYSTEMATIC ASSESSMENT AT ADMISSION

Step	Assessments to include
Review of systems	<ul style="list-style-type: none">▪ Weight loss in preceding 6 months▪ Dietary change▪ Anorexia, nausea, vomiting, diarrhea▪ Problems with memory or confusion▪ Falls or difficulty with walking▪ Difficulties with vision or hearing
Physical examination	<ul style="list-style-type: none">▪ Take pulse (confirm arrhythmias with ECG)▪ Assess for loss of subcutaneous fat, muscle wasting, edema, ascites▪ Screen with Mini-Cog or MMSE▪ Assess vision and hearing▪ Use a depression screen

FUNCTIONAL IMPAIRMENTS (1 of 2)

- ~15% of patients ≥ 70 years old decline during hospitalization in ability to perform ADLs
- Another 23% leave the hospital without recovering pre-hospitalization abilities
- 15% of those admitted from home are discharged to a nursing home
- Optimal hospital care includes promotion or maintenance of independent functioning

Pre-admission and Discharge Function for 404 patients who declined in function



- Sager MA et al. Arch Intern Med 156; 1996

FUNCTIONAL IMPAIRMENTS (2 of 2)

- Nearly 50% of new-onset disability in frail elders is attributable to a hospitalization
- Risk factors for new-onset, hospitalization-associated disability in hospitalized elders ≥ 70 yr in validated clinical index:
 - Age, baseline IADL dependencies, mobility 2 weeks pre-admission, metastatic cancer or stroke, albumin < 3.0 g/dL
 - Higher scores predicted more severe disability, greater likelihood of nursing home placement, and worse survival

CAUSES OF FUNCTIONAL DECLINE

- Acute illness (conflicting evidence)
- Deconditioning with sustained bed rest (reduced aerobic capacity, muscle strength, respiratory function, vasomotor instability)
- Medical and surgical therapies (feeding tubes, bladder catheters)
- Adverse drug events (age-related changes in pharmacokinetics and pharmacodynamics, polypharmacy). 6.5% per 100 admissions
- Hostile hospital environment (restraints, slippery appearing floors, clutter, absent handrails)
- Diagnostic and therapeutic mishaps (5-7% per 1000 admissions)
- Psychosocial factors
- Undernutrition

CONSEQUENCES OF FUNCTIONAL DECLINE

- Loss of independence and self esteem
- Longer lengths of stay and rehabilitation
- Increased risk of rehospitalization
- Increased risk of falls and death
- Increased likelihood of nursing home placement (NHP) -

study of 551 general medical patients >70 yr

-decline-no improvement group (OR 3.19), and stable-decline group (OR 2.77) were at highest risk for NHP

-function at discharge was the key determinant of NHP

-living alone (OR 3.54)

-fewer African Americans institutionalized (OR 0.36)

(Fortinsky, Palmer et al: J of Gerontol 1999)

PATHOPHYSIOLOGICAL CONSEQUENCES OF IMMOBILIZATION

- Muscle - decreased mass, strength, oxidative capacity
- Bone - bone loss
- Joint - loss of full range of motion
- Skin - pressure ulcer
- Cardiovascular - decreased work capacity, postural hypotension
- Respiratory - decreased ventilation, V/Q mismatch, atelectasis
- Gastrointestinal - decreased appetite, constipation
- Genitourinary - incomplete bladder emptying, pooling in renal calyces
- Metabolic - insulin resistance
- Cognitive - perceptual changes, decreased cognitive function
- Psychiatric - depression, anxiety
- Postural control - increased postural sway

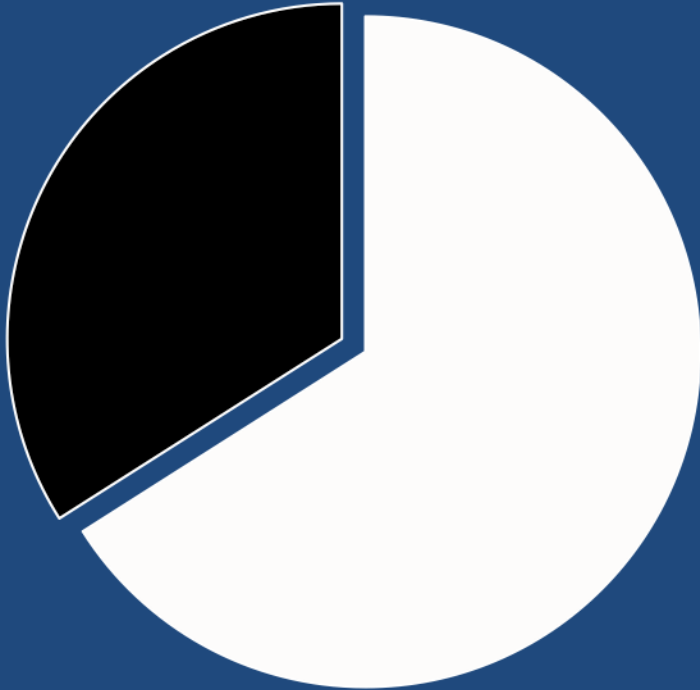
IMMOBILITY AND FALLS

- During H & P, assess gait, balance, lower-extremity strength, ability to get up from bed
- Inquire about history of falls and perform a careful musculoskeletal and neurologic exam
- Hospitalized older patients should walk at least several times daily, with assistance if needed
- PT may benefit patients with weakness, gait abnormalities
- Avoid restraints and tethers
- Minimize psychoactive drugs associated with falls

SENSORY IMPAIRMENT

- Impaired vision and hearing are risk factors for falls, incontinence, delirium, and functional dependence
- Routinely ask older patients if they have difficulty with seeing or hearing, and ask family to bring in hearing aids and glasses
- Evaluate visual acuity (eg, with a pocket card of the Jaeger eye test)
- Evaluate hearing by whispering a short, easily answered question in each ear

DEPRESSION (1 of 2)



- Major or minor depression occurs in ~33% of hospitalized patients ≥ 65 years but is often undiagnosed
- Depression is associated with increased risk of dependence in ADLs, increased risk of nursing-home placement, and shorter survival

DEPRESSION (2 of 2)

- Routinely ask patients if they feel down, depressed, or hopeless, or whether they have lost interest or pleasure in doing things
- A positive response can be followed up by a formal assessment for an affective disorder
- Psychotherapeutic interventions are often effective in initial management
- Drug therapy is rarely necessary during hospitalization for a nonpsychiatric condition, but follow-up shortly after discharge is critical

COGNITIVE IMPAIRMENT

- Hospitalization rate of older people with dementia 3× that of those who are cognitively intact
- They require more nursing care, have longer hospitalizations, and are more likely to develop delirium
- Cognitive impairment is a risk factor for delirium, falls, use of restraints, therapy nonadherence, and feeding tube placement
- Assess using MMSE, Mini-Cog, or other established test
- When dementia is a possibility, exclude reversible causes and identify patients for whom drug therapy or family-oriented interventions are warranted

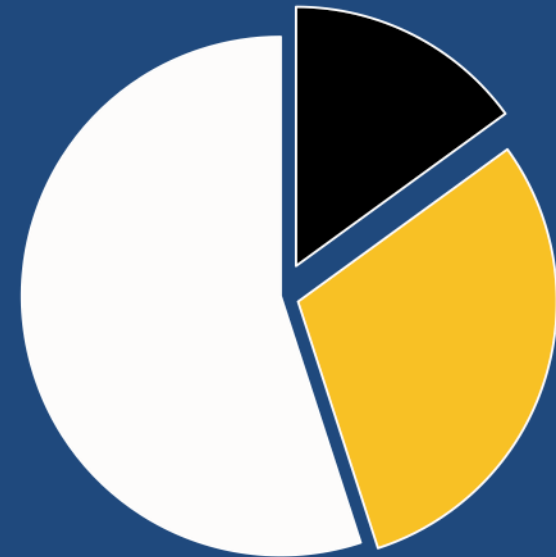
PAIN MANAGEMENT IN PATIENTS WITH COGNITIVE IMPAIRMENT

- Most patients with mild to moderate dementia, compared to less than half with severe dementia, can comprehend ≥ 1 pain scale
- Avoid PCA pumps or as-needed analgesics in those unable to recognize pain trajectory
- Consider around-the-clock analgesic, especially for frequent pain
- Anticipate opiate adverse effects (eg, constipation)

DELIRIUM (1 of 2)

- Predictor of prolonged hospital stay if it arises during hospitalization
- Associated with in-hospital death and nursing-home placement
- Consider if the patient exhibits:
 - Acute onset and fluctuation in mental status or behavior
 - Inattention
 - Disorganized thinking
 - Altered consciousness

10% to 15% of older adults on admission



Develops in 15% of older adults during hospital stay

DELIRIUM (2 of 2)

- Incident delirium can be reduced by 1/3 by managing:
 - Cognitive impairment
 - Sleep deprivation
 - Immobility
 - Visual impairment
 - Hearing impairment
 - Dehydration
- To prevent or ameliorate delirium:
 - Avoid medicines associated with delirium
 - Prevent and treat infection
 - Detect and correct metabolic abnormalities
 - Frequently orient patients with cognitive or sensory impairment
 - Avoid excessive bed rest, room changes, and restraints

SUBOPTIMAL PHARMACOTHERAPY

- During hospitalization and at discharge, a medications review is useful to identify prescribing errors in 6 common categories:
 - Inappropriate choice of therapy
 - Incorrect dosage
 - Incorrect schedule
 - Drug-drug interactions
 - Therapeutic duplication
 - Allergy
- Consultation with a clinical pharmacist optimizes pharmacotherapy

ADVERSE DRUG EVENTS (ADE)

- In-hospital incidence of ADE is 6.7%
- A risk index predicts ADE in hospitalized older adults using the following factors:

Number of drugs

History of adverse drug reactions

Liver disease

≥4 conditions

HF

Renal failure

SLEEP DISTURBANCE

- $>1/3$ of hospitalized older patients experience sleep difficulty in the hospital
- Sources of disruption are intrinsic (eg, drug withdrawal, medical illness) and extrinsic (eg, noise, processes-of-care) factors
- Sedatives provide a poor benefit-to-harm ratio
 - Number needed to treat = 13
 - Number needed to harm = 6
- Nonpharmacologic protocols can be effective

PRESSURE ULCERS

- Incidence of hospital acquired pressure ulcers: 7%–9%; 60% acquired in acute care setting
- A CMS “never event”
- Preventive interventions: daily skin inspection, specialized foam or sheepskin overlay, dynamic support mattress, frequent repositioning, attention to nutrition, skin moisturizer

NUTRITION (1 of 2)

- On admission:
 - Severe protein-calorie malnutrition is present in approximately 15% of patients ≥ 70 years
 - Moderate malnutrition is present in another 25%
 - Electrolyte and vitamin deficiencies common
- 25% of older patients suffer further nutritional depletion during hospitalization
- Malnutrition is associated with increased risk of death, dependence, and institutionalization

NUTRITION (2 of 2)

- Clinicians should assess malnourished patients for remediable factors such as:
 - Difficulty with chewing
 - Insufficient time or encouragement to eat
 - Medications that impair appetite
 - Difficult access to food
- Consider supplements and maintain fluid and electrolyte balance

IMMUNIZATION STATUS

- Assess the vaccination status upon admission and update as needed
- 2/3 of patients hospitalized with serious pneumococcal infection had been in acute care in the previous 3–5 years
- PPV protects against invasive disease
- Whether administered in the hospital or ambulatory setting, influenza vaccine is immunogenic & safe

DEEP VEIN THROMBOSIS PROPHYLAXIS

- Older patients are less likely to present with typical symptoms of VTE
- The Padua Prediction Score uses many factors to assess risk (age, VTE history, thrombophilia, cancer, cardiac or respiratory failure, immobility, use of hormonal medication)
- Consider renal function in deciding which antithrombotic to use and selecting dose
 - LMWH and fondaparinux are renally cleared

INTENSIVE CARE OF THE CRITICALLY ILL (1 of 2)

- Adults > 65 years old account for ~50% of ICU admissions & 60% of total ICU days in the US
- Those with acute lung injury or acute respiratory distress syndrome have higher mortality with increasing age
- Prolonged mechanical ventilation is likely due to a combination of severe initial illness and multiple organ impairments
- Surviving severe sepsis puts the older patient at greater odds of cognitive & functional deterioration
- The three most common inappropriate medications used were anticholinergics (37%), nonbenzodiazepine hypnotics (14%), and opioids (12%) [Morandi et al. JAGS July 2013, 61\(7\)](#)

DAILY EVALUATION OF OLDER HOSPITALIZED PATIENTS

- Assess progress toward mobility and ADL recovery
- Identify and discontinue devices as appropriate (venous and urinary catheters)
- Restrict and avoid the use of restraints
 - Encourage use of family or “sitters” as companions to monitor and assure safety in confused patients

SYSTEMS OF CARE FOR HOSPITALIZED OLDER PATIENTS

Three innovative approaches have been demonstrated to improve hospital care of older patients:

- **Geriatric Evaluation and Management (GEM) Unit**
- **Acute Care for Elders (ACE) Unit**
- **Hospital Elder Life Program (HELP)**

GEM UNIT

- For older patients who have stabilized during acute hospitalization
- Integrates comprehensive geriatric assessment with interdisciplinary team-based care
- A multicenter randomized trial demonstrated:
 - Improvements in ADLs, physical performance, and some measures of health-related quality of life
 - No effect on mortality or cost

ACE UNIT (1 of 2)

- Designed to help acutely ill older patients achieve or maintain independence in ADLs
- Four components:
 - Environment promotes mobility and orientation
 - Patient-centered, nursing-initiated protocols
 - Early social work intervention
 - Medical care review to promote optimal prescribing
- In randomized trials, improved ADL function at end of hospitalization; increased patient, family, and clinician satisfaction; and reduced costs

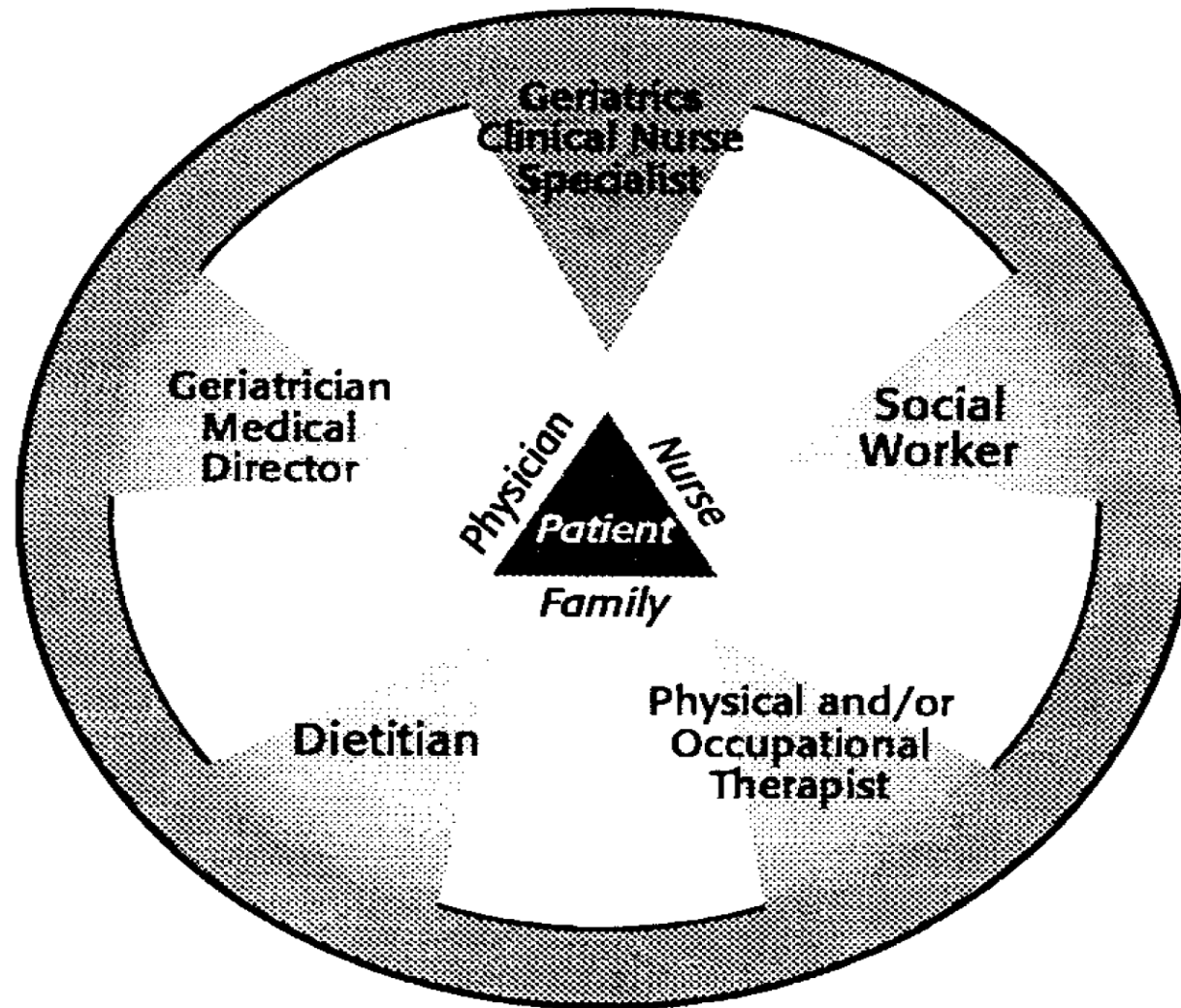


Figure 1. ACE interdisciplinary team model.

Enhanced delivery of care...

● Acute Care Units for the Elderly (ACE Units)

- being pioneered in many institutions using a biopsychosocial model;
- maintenance of function (daily review by nurses)
- interdisciplinary teamwork
- considering patient needs in the hospital and home
- prepared environment to foster independent self-care
- early discharge planning, involvement of area agencies
- daily review of medications, procedures by medical director

**ACE unit bedroom
U Texas,
Galveston**



**Patient/visitor lounge
and refreshment area**

HOSPITAL ELDER LIFE PROGRAM

- A multicomponent intervention to prevent delirium
- Consists of protocols to manage 6 risk factors for delirium: cognitive impairment, sleep deprivation, immobility, visual impairment, hearing impairment, dehydration
- In a prospective controlled study, the incidence of delirium was reduced by one third, from 15.0% to 9.9%

Caregiver Burden of Cognitively Impaired Elders Increases with

- Younger caregiver age
- Depression
- Limited finances at the end of the month
- Being a spouse
- Distressing neuropsychiatric symptoms and delirium
- Functional deficits in ADLs

Shankar et al. JAGS Feb 2014, 62(2)

SOCIAL SUPPORT AND LONELINESS

- Loneliness may precipitate physical symptoms or vice versa
- Loneliness is related to subsequent mortality and NHP
- Disruption or absence of social support is linked to increased morbidity (after MI), depression, and cognitive decline, NHP, increased use of hospitals
- Social support especially important for bedside nurturing, financial assistance, and links to bureaucratic organizations

TRANSITIONS FROM THE HOSPITAL

- Should aim to maximize the chance that patients will maintain the benefits of hospitalization
- Can reduce the risk of early readmission and the use of emergency services
- Ideally begin at admission, with a projection of medical, nursing, rehabilitative, and functional support required at the time of discharge

POST-ACUTE CARE CONTINUUM OF SERVICES

- Rehabilitation hospital or acute hospital rehabilitation unit
- Subacute care units (hospital or NH based, free-standing)
- Transitional care units
- Specialty units for ventilator care
- Home health care
- Physician home visit program
- Home hospital program or PACE program
- End of life care

TRANSITION TO HOME

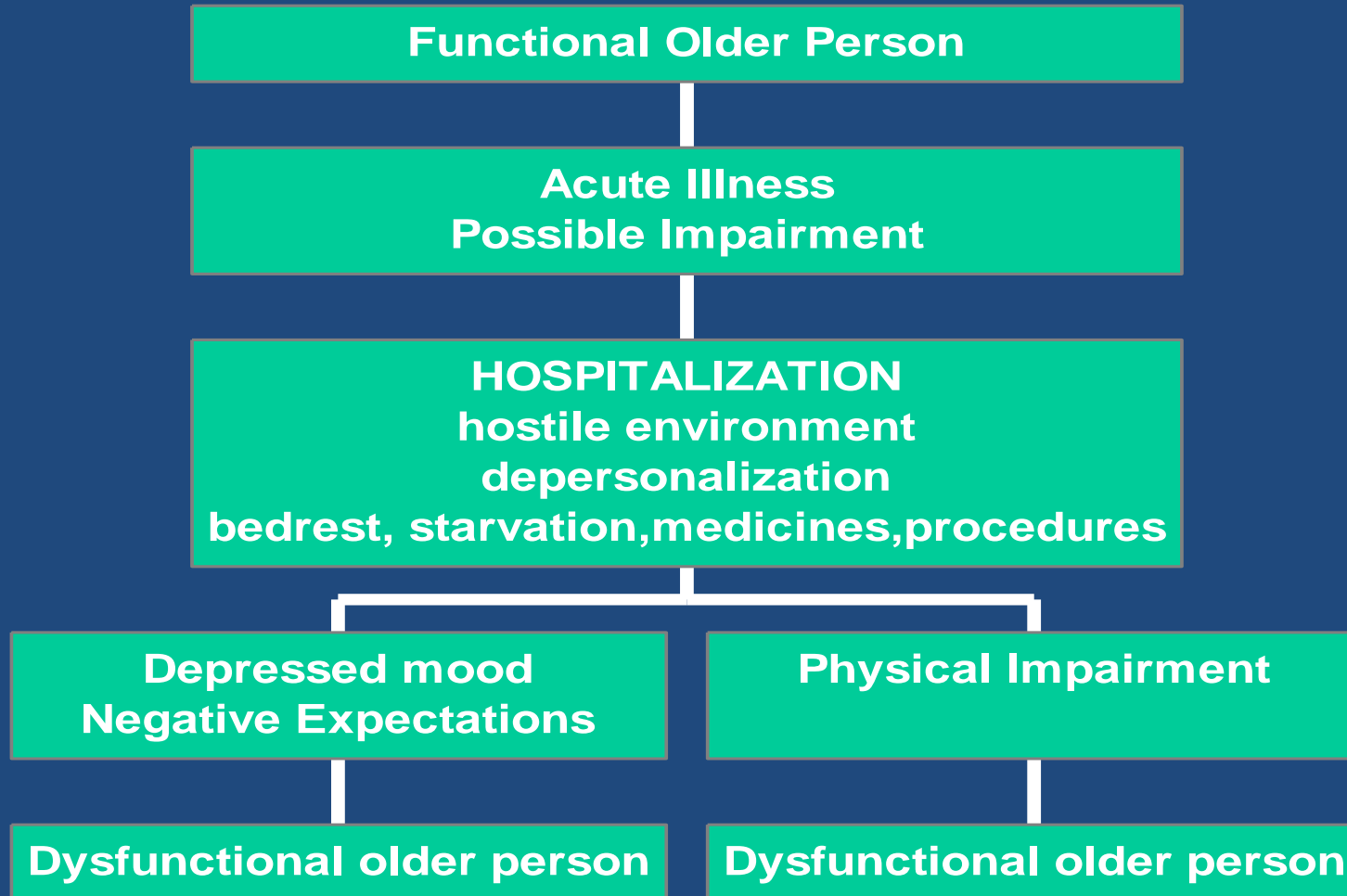
Communicate the following to patients or their caregivers:

- Follow-up appointments
- Warning symptoms or signs to watch for, with instructions on whom to contact
- Clinical disciplines (eg, nursing, physical therapy) contracted for care in the home
- Reconciled medications list, with clarification of which pre-hospital medications are to be continued

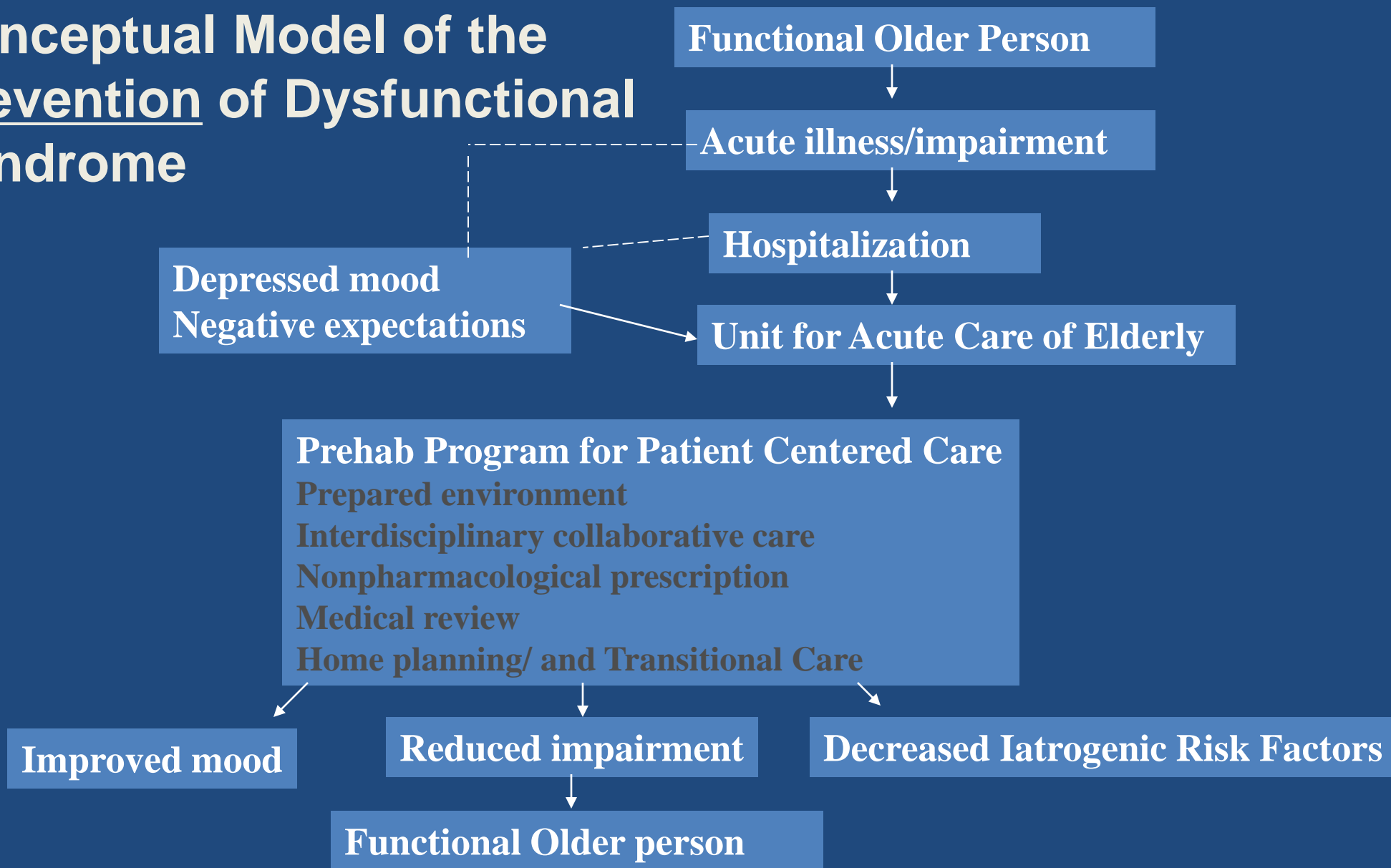
TRANSITION TO ANOTHER INSTITUTION

- Orient the patient to the nature of the institution, the identity of the new attending physician, and the expected frequency of physician visits
- Promptly send a discharge summary that includes:
 - Summary of hospital course with care provided
 - List of problems and diagnoses
 - Baseline physical functional status
 - Baseline cognitive status
 - Reconciled medications list (with ending dates for time-limited drugs)
 - Allergies
 - Test results still outstanding
 - Follow-up appointment
 - Goals and preferences
 - Advance directives

Conceptual model of the Dysfunctional syndrome



Conceptual Model of the Prevention of Dysfunctional Syndrome



SUMMARY

- Irrespective of the patient's age, the best guides to hospital care are the clinical circumstances and the patient's preferences
- Hospitalized older patients should be routinely assessed for certain common geriatric problems, regardless of admission diagnosis
- Alternative systems for providing hospital care have improved outcomes for older patients



Thank you

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